

Claims:

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- 5 1. An electrical switching device having a microrelay switch (1) in a current path (8), having a short-circuit current limiter (11, 16, 17) in the current path (8) for interrupting a large overcurrent, and having an evaluation device (7) for receiving and evaluating signals from a current sensor (5) which detects the current through the current path (8), with
- 10 the switching device being designed such that the microrelay switch (1) opens in response to a tripping signal (9) from the evaluation device (7) in the event of small overcurrents above a threshold value and, in the event of large overcurrents, the short-circuit
- 15 current limiter (11, 16, 17) limits these currents to currents which can be interrupted by the microrelay switch (1).
2. The electrical switching device as claimed in
- 20 claim 1, in which the evaluation device (7) causes the microrelay switch (1) to respond with a short time delay as a function of the magnitude of any overcurrent.
- 25 3. The electrical switching device as claimed in claim 1 or 2, in which the short-circuit current limiter is a fuse link (11).
- 30 4. The ~~switching~~ switching device as claimed in claim 1 or 2, in which the short-circuit current limit (17) can be uploaded electrically, and the evaluation device (7) is designed to transmit a second tripping signal (18) to the short-circuit current limiter (17) in the event of large overcurrents.
- 35 5. The electrical switching device as claimed in claim 1, 2 or 3, in which the short-circuit current limiter is a power breaker (17).
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6. The electrical switching device as claimed in one of the preceding claims, in which the short-circuit current limiter is a PTC thermistor (16).

5 7. The electrical switching device as claimed in claim 6, in which the PTC thermistor (16) contains a PTC polymer material.

10 8. The electrical switching device as claimed in claim 6, in which the PTC thermistor (16) contains a PTC metal material.

15 9. The electrical switching device as claimed in one of the preceding claims, in which the evaluation device (7) is designed for receiving and evaluating signals from a first current sensor (5), which detects the current through the current path (8), and from a second current sensor, which detects a current through a second current path, by comparing them with one another and opening the microrelay switch (1) in response to a result of the evaluation.

20 10. The electrical switching device as claimed in one of claims 1-8, in which the current sensor (5) is a total current sensor which detects a total current through the current path (8) and through at least one second adjacent current path, and the evaluation device (7) is designed for receiving and evaluating a signal from the total current sensor and for opening the microrelay switch (1) in response to that signal.

35 11. The electrical switching device as claimed in one of the preceding claims, in which at least one current sensor (5) is part of the switching device and is in the form of a Hall sensor.

12. The electrical switching device as claimed in one of the preceding claims, in which the microrelay switch

(1) has microrelay cells (3) connected in series as a voltage divider.

13. The electrical switching device as claimed in one  
5 of the preceding claims, in which the microrelay switch  
(1) has microrelay cells (3) connected in parallel as a  
current divider.

14. The electrical switching device as claimed in one  
10 of the preceding claims, in which the microrelay switch  
(1) has at least one microrelay (3) with a contact  
piece (4) which moves mechanically in an electrostatic  
manner.

15. The electrical switching device as claimed in one  
15 of the ~~preceding~~ claims, in which the microrelay  
switch, the evaluation device and, possibly, the Hall  
sensor or sensors are each integrated as chips on a  
circuit board.

20 16. The electrical switching device as claimed in one  
of the preceding claims, in which the microrelay switch  
(1) and the evaluation device (7) are integrated on one  
chip (6).

25 17. The electrical switching device as claimed in  
claim 11, also in conjunction with any further one of  
the preceding claims, in which the evaluation device  
(7) and the Hall sensor or sensors (5) are integrated  
30 on a chip (6).

18. The electrical switching device as claimed in  
claim 11, also in conjunction with any further one of  
the preceding claims, in which the microrelay switch  
35 (1), the evaluation device (7) and the Hall sensor or  
sensors (5) are integrated on one chip (6).

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19. The electrical switching device as claimed in one  
of the preceding claims, in which an electronic

response monitoring device (7) is integrated, with the microrelay switch (1), on one chip (6).

20. The electrical switching device as claimed in one  
5 of the preceding claims, in which a timer circuit is integrated, with the microrelay switch (1), on one chip (6).

21. An electric motor switching and protection system  
10 having an electrical switching device as claimed in one of the preceding claims.